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(54) Abstract Title  
**A parcel trace system**

(57) A system for tracing parcels handled by a service provider for a plurality of clients is disclosed. The system includes relay software 30 adapted to communicate with the clients across the Internet and with a server 60' database 20'. The server database stores parcel objects, each including a parcel identifier attribute and a parcel location attribute. The server database further stores a URL attribute for each client. A client database 80 stores parcel objects, each object corresponding to a parcel being handled for the client and including a parcel identifier and parcel location attribute. A client database controller 70 communicates with the relay software, and across a second network, possibly the Internet, with the client. The relay software is responsive to a change of state of the parcel location attribute to signal it to the client database controller across the Internet. The client database controller responds to receipt of the change in state of parcel location to write it to the client database. The client database controller is further responsive to parcel location requests from the client across the second network to return a location and a parcel identifier for any parcel location requested by the client.

The delivery service company, in effect, echoes its tracking of the parcel directly onto the client's webpage. All the parcels belonging to a given client appear on the same page thus saving the time which would be taken to access different supplier systems and to enter codes individually for each parcel.

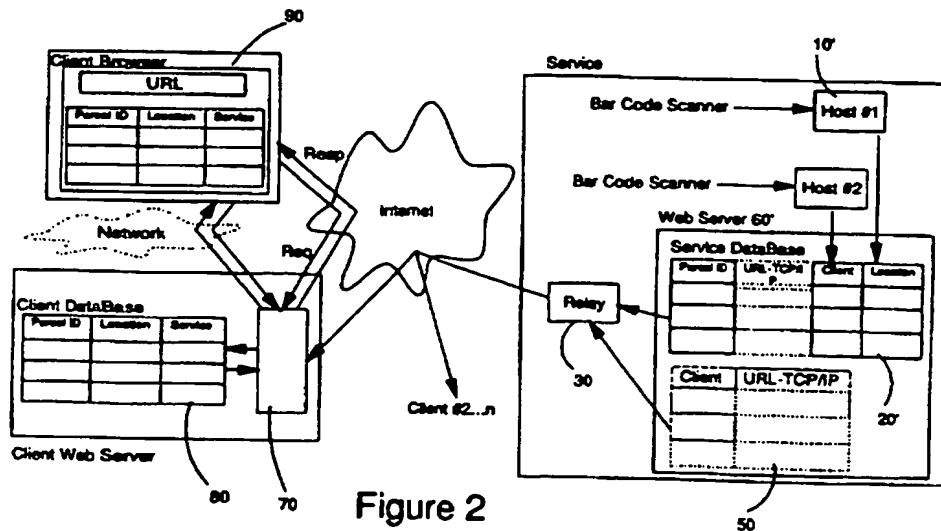


Figure 2

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## AN IMPROVED PARCEL TRACE SYSTEM

The present invention relates to an improved parcel trace system.

5           Figure 1 shows a conventional parcel trace system. A parcel  
delivery service provider, for example, Federal Express, UPS or DHL,  
assigns a unique parcel identification, known as an Air Bill number, to  
each parcel. This is done by providing to a client two-part blank forms,  
each including a unique pre-printed bar code, corresponding to the Air  
10 Bill number, on each part of the form. One part of a form is attached to  
the parcel, while the client retains the other part of the form including  
a copy of the barcode affixed to the parcel. The parcel identification  
barcode is scanned at a number of locations worldwide at each stage of  
delivery to track its progress. The barcode scanner communicates with a  
15 host computer 10 to transmit the parcel ID to the host computer. The  
parcel ID and its location information is transmitted by the host  
computer 10 to one or more web servers 60 (only one shown) each including  
a database table 20 maintained by the service provider.

20           The client, running a web browser 90, is able to link through the  
Internet 40 to the service provider web server 60, and thus the database  
table 20, by specifying a URL (universal resource location). The URL  
usually points to a HTML file which is transmitted to the client who is  
then prompted to enter the unique parcel ID and optionally the client ID,  
25 for security reasons. These are transmitted to the service provider web  
server 60 and used as search criteria by the service provider, which  
returns the current location of the client's parcel to the browser 90 for  
display.

30           A problem exists where a large client may use a variety of delivery  
service providers, each with different web pages, to send multiple  
parcels. It is a time consuming exercise to track these parcels, with  
separate parcel identifications to be entered for each parcel, and  
separate service provider web pages to be accessed.

35           It is an object of the present invention to provide a parcel trace  
system capable of accommodating single-point tracking by a client of a  
plurality of parcels being handled by a number of different delivery  
service companies.

Accordingly, in a first aspect, the present invention provides a parcel trace system for tracing parcels handled by a service provider for a plurality of clients, said system including relay means adapted to communicate with said clients across a first network and with a server database, said server database being adapted to store a plurality of parcel objects, each parcel object including a parcel identifier attribute and a parcel location attribute, said server database further including a first network address attribute for said clients and wherein said relay means is responsive to a change in state of said parcel location attribute to relay said change in state of said parcel location attribute across said first network to a client for whom said parcel is being handled.

In a second aspect, the invention provides a parcel trace system for tracing parcels handled by a plurality of service providers for a client, said system including a client database controller and a client database, said client database including a plurality of parcel objects, each parcel object corresponding to a parcel being handled for said client and including a parcel identifier and a parcel location attribute, said client database controller being adapted to communicate across a first network with a plurality of relay means, each associated with a respective service provider, and across a second network with said client, each relay means being responsive to a change in state of a parcel location handled by an associated service provider to relay said change in state to said client database controller across said first network, said client database controller being responsive to receipt of said change in state of parcel location to write said change of state to said client database, said client database controller being further responsive to parcel location requests from said client across said second network to return a parcel location and a parcel identifier for any parcels requested by said client.

Embodiments of the invention will now be described with reference to the accompanying drawings, in which:

Figure 1 is a schematic view of a conventional parcel trace system; and

Figure 2 is a schematic view of a parcel trace system according to the present invention.

In a first embodiment of the invention, Figure 2, a client uses conventional barcode generating software to generate barcoded labels for parcels. The software enables the client to encode a URL or possibly a TCP/IP address, a parcel identification code, and other optional information (eg update authorization) and print this information as a barcoded label that is physically applied to the packaging of a parcel or other item for delivery.

A delivery service picks up the parcel and at various intermediate locations in the course of delivery of the parcel, the delivery service scans the barcode, usually with a hand held scanner, and the barcode information is dumped to a host machine 10' at the location. The barcoded information is transmitted by the host 10' to a delivery service web server 60' in a conventional manner. The server 60' translates the barcode information into the client's URL and parcel identification code and stores this information as a parcel object in a database table 20'. In the first embodiment, the table 20' includes a parcel ID, a URL or TCP/IP address, an optional client ID and a location attribute.

In order to ensure secure access to parcel location information, the database may already have received the client information associated with a parcel from when the parcel was picked up by the service provider. Alternatively, the information can be included in the barcode and inserted in the database table 20' whenever it is updated with location information.

Relay software 30 on the delivery service's server 60' or connected to this server continually monitors, or is triggered by changes in the database table 20'. When a parcel object is updated with new location information, the software 30 establishes a link to the Internet and accesses the client's parcel tracking home page using the scanned URL. In one embodiment of the invention, the clients home page resides on a web server with a CGI-BIN standard back end controller 70 controlling access to a database table 80. Thus, the URL is of the form:

"http://domain/path/update.cgi-bin/parcelID+location+service"

This URL connects the relay software 30 to the specified path on the specified domain and will cause the back end controller 70 to execute a script file called update. "parcelID+location+service" are passed as parameters to the script file which, for example, calls a database

program to write or update a parcel object with the new location and service provider information. An example of a suitable database management system which could be employed for implementing the database table 80 or the table 20' is DB2 produced by IBM. It will be seen that the invention is not limited to CGI-BIN and other examples of back-end controllers are PERL or ISAPI produced by Microsoft.

In a similar manner to writing the information, a client browser 90 retrieves information from the database 80 using a URL of the form:

"http://domain/path/retrieve.cgi-bin/criteria"

In this case, a script file retrieve is called by the back-end controller 70 with a set of criteria, possibly null if all parcel information is to be retrieved, and the location for each parcel selected from the database is returned for display on the client browser 90.

If a TCP/IP address is used, then the relay software can connect in a peer to peer manner with the client's web server and write the information to the database 80 in any manner the client and service provider may agree on.

In any case, the software 30 provides the parcel reference code, optionally the name of the delivery service provider, and the parcel location information for insertion into the client's parcel tracking database 80.

It will be seen that the database 80 can be accessed by a client running a conventional browser using either the Internet or Intranet. The client can use conventional CGI-BIN requests or a dedicated applet to retrieve and display the information, or if the client is using another type of network, a dedicated application program could be written to access the database 80.

In any case, the database 80 can be interrogated to display the location of the parcel, and any other of the client's parcels, in an appropriate form on a page that is accessible only by the client.

It will be seen that the delivery service company effectively 'echoes' its tracking of the parcel directly onto the client's webpage. All the clients parcels, with whatever service, thus appear on the same

page and the client does not need to access systems and enter codes individually for every item (there could be hundreds).

5       The benefit is that a large client can track all of its parcels in one go, and with any number of delivery services using the system. A postroom can display the relevant webpage showing the delivery status of all items constantly and just refresh it every now and then.

10       It will be seen that because every client's TCP/IP or URL address is unique, there will be no conflict between barcodes produced by different clients for different service providers.

15       In a second embodiment of the invention, the client needs to register with a delivery service in advance of sending parcels. At registration, the client provides his TCP/IP address or the URL of his parcel tracking data capture home page to the delivery service. This is recorded by the delivery service in a database table 50 having only a client ID and a URL - TCP/IP address attributes for future use.

20       The client's software generates barcodes on adhesive labels in the conventional manner. There is no need to include the client's URL or TCP/IP address, only the parcel ID and any other optional information. Thus, the table 20' in the second embodiment does not include the URL or TCP/IP address attribute of the first embodiment.

25       The delivery service scans the barcode on the parcel in the same way as in the first embodiment, however, the delivery service's relay software 30 in this case uses the database table 50 to lookup up the client's URL using the unique client reference code associated with a parcel.

30       The advantage of the first embodiment is that there is no requirement for pre-registration with a delivery service and the parcel may be sent with any delivery service using the described system. It does, however, require delivery services to be able to adapt to a change in the format of their bar codes.

35       The advantage of the second embodiment is that access to the client's parcel tracking data access home page is secure and only accessible by authorised delivery services. The delivery services need

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only install the relay software 30, for forwarding updated location information to a client.

5        It will be seen that the location attribute of the database table 20' of either embodiment can be in a variety of formats. The location may be a simple set of states such as "to be picked up", "in transit", "delivered" or its state may reflect the actual geographical location of the package.

10       It will be seen that both embodiments share the advantage that a client can keep more useful information on its own database 80, than would the service provider on their database tables 20 or 20'. A client could therefore flag the postroom with the urgency of delivery of a parcel, or with a contact name to call when the parcel is delivered.

## CLAIMS

1. A parcel trace system for tracing parcels handled by a service provider for a plurality of clients, said system including relay means adapted to communicate with said clients across a first network and with a server database, said server database being adapted to store a plurality of parcel objects, each parcel object including a parcel identifier attribute and a parcel location attribute, said server database further including a first network address attribute for said clients and wherein said relay means is responsive to a change in state of said parcel location attribute to relay said change in state of said parcel location attribute across said first network to a client for whom said parcel is being handled.

2. A parcel trace system for tracing parcels as claimed in claim 1, said system further including a client database controller and a client database, said client database including a plurality of parcel objects, each object corresponding to a parcel being handled for said client and including a parcel identifier and a parcel location attribute, said client database controller being adapted to communicate across said first network with said relay means, and across a second network with said client, said relay means adapted to relay said change in state of said parcel location attribute to said client database controller across said first network, said client database controller being responsive to receipt of said change in state of parcel location to write said change of state to said client database, said client database controller being further responsive to parcel location requests from said client across said second network to return a location and a parcel identifier for any parcels requested by said client.

3. A parcel trace system as claimed in claim 1 in which said server database includes a first table comprising a parcel identifier, a network address and a location attribute for each parcel object.

4. A parcel trace system as claimed in claim 1 in which said server database includes a first table comprising a parcel identifier, a network address, a client identifier and a location attribute for each parcel object, and a second table comprising a client identifier and a network address attribute for each client.



5. A parcel trace system as claimed in claim 1 in which said network address attribute is a universal resource location attribute.

5 6. A parcel trace system for tracing parcels handled by a plurality of service providers for a client, said system including a client database controller and a client database, said client database including a plurality of parcel objects, each parcel object corresponding to a parcel being handled for said client and including a parcel identifier and a parcel location attribute, said client database controller being adapted to communicate across a first network with a plurality of relay means, 10 each associated with a respective service provider, and across a second network with said client, each relay means being responsive to a change in state of a parcel location handled by an associated service provider to relay said change in state to said client database controller across 15 said first network, said client database controller being responsive to receipt of said change in state of parcel location to write said change of state to said client database, said client database controller being further responsive to parcel location requests from said client across said second network to return a parcel location and a parcel identifier 20 for any parcels requested by said client.

7. A parcel trace system as claimed in claim 2 or 6 in which said first and second networks are the Internet.



Application No: GB 9726740.5  
Claims searched: 1,6

Examiner: Leslie Middleton  
Date of search: 30 June 1998

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.P): G4A (AUXF, AUXX)

Int Cl (Ed.6): G06F 17/60

Other: Online: INSPEC, WPI.

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
A	WO 97/08628 A1 (K & T LTD.) See Fig.2,& pp.1-9.	

X Document indicating lack of novelty or inventive step  
Y Document indicating lack of inventive step if combined with one or more other documents of same category.  
& Member of the same patent family

A Document indicating technological background and/or state of the art.  
P Document published on or after the declared priority date but before the filing date of this invention.  
E Patent document published on or after, but with priority date earlier than, the filing date of this application.

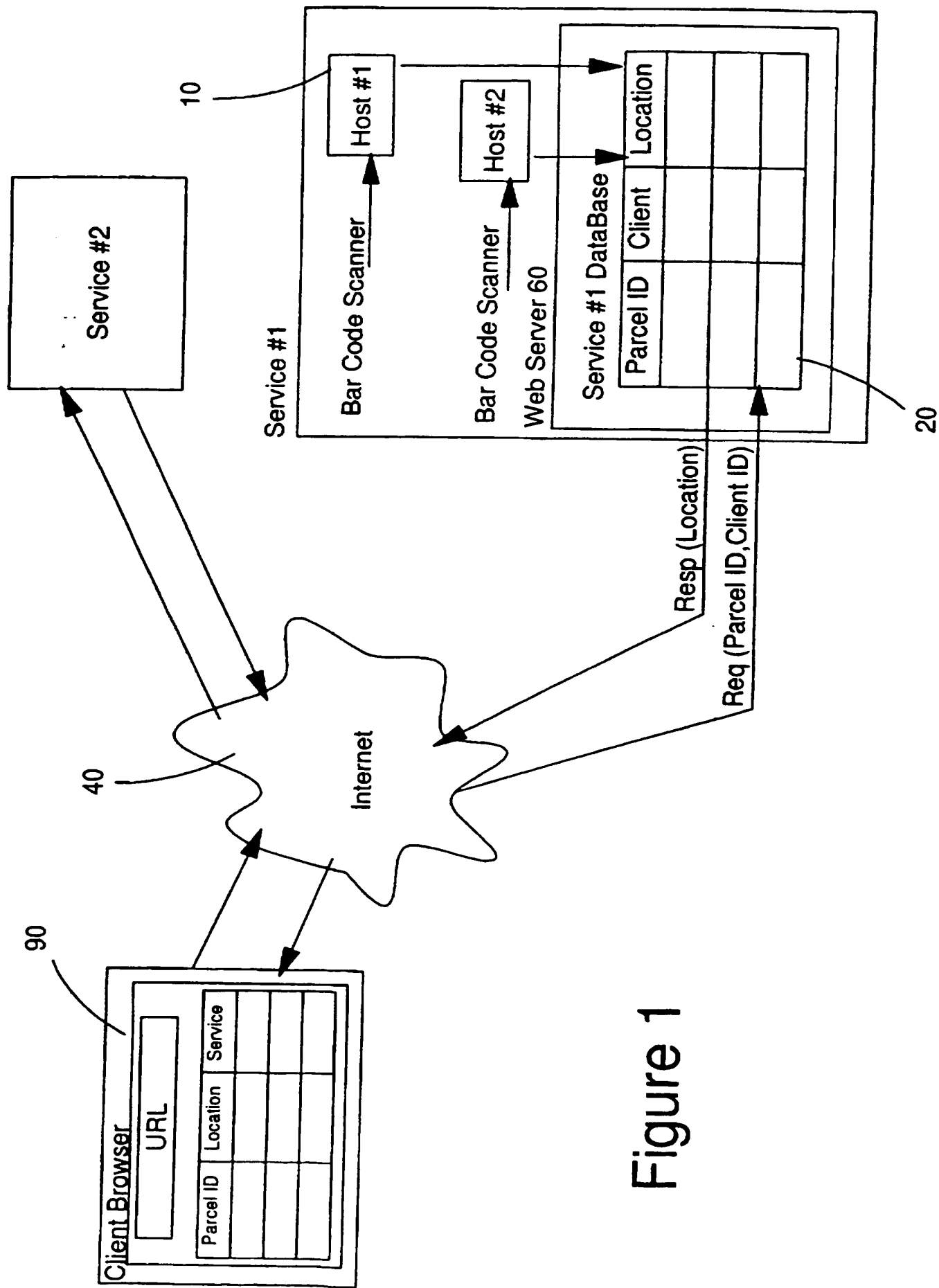


Figure 1

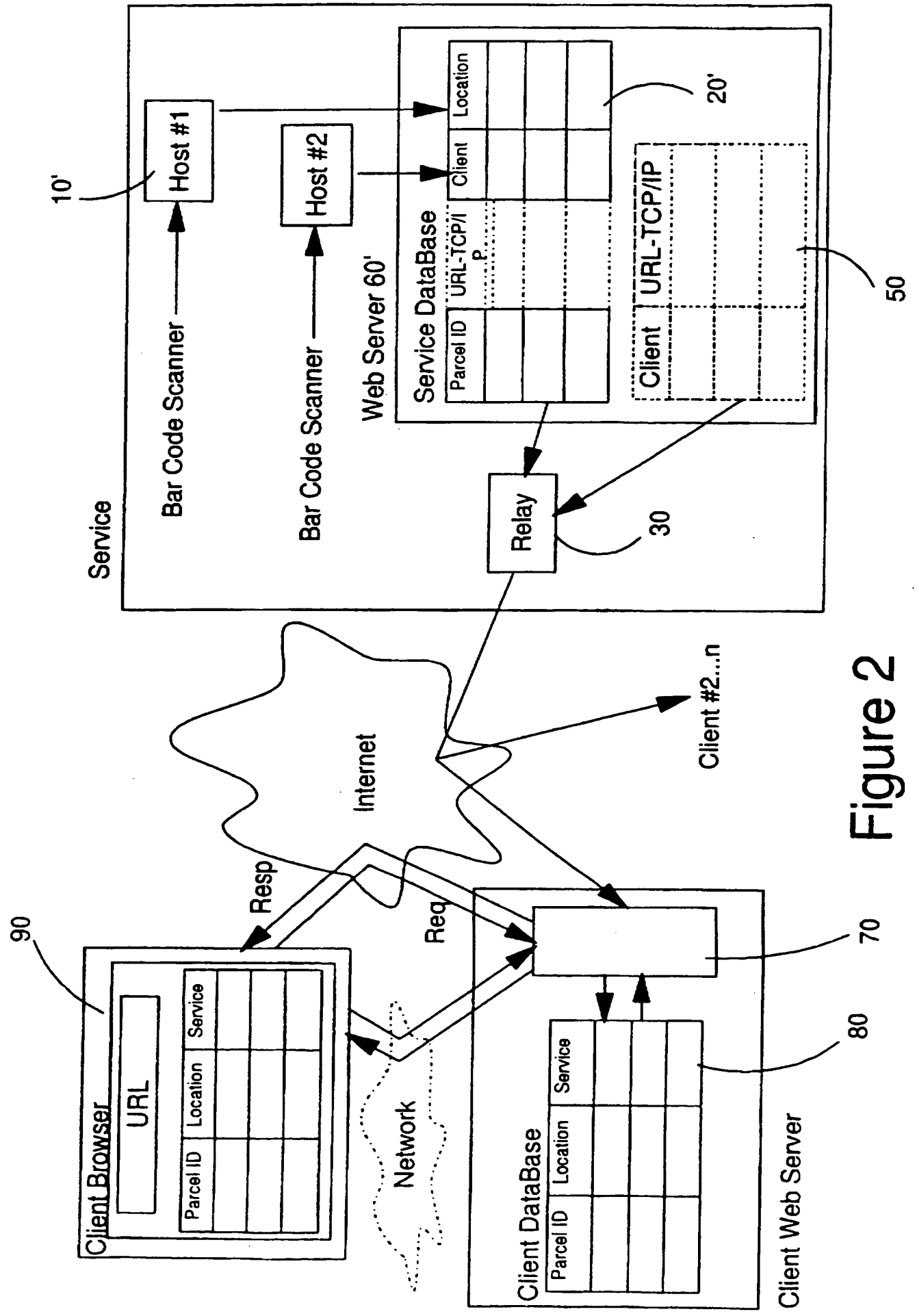


Figure 2